SCOPING REPORT

INTERSTATE 93 IMPROVEMENTS
Salem to Manchester, NH

Project #10418-C (I-93 Corridor Improvements)
Federal # IM-IR-93-1(174)0

Prepared for:

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Purpose and Need

1.1 Introduction

This Scoping Report documents the first phase of the Environmental Study to evaluate improvements to the Interstate 93 (I-93) transportation corridor between Salem and Manchester, New Hampshire. The report includes a statement of the purpose and need for the project, a discussion relative to the Study Area limits, a description of existing environmental resources (natural, cultural, and socio-economic) within the Study Area and issues of concern with respect to implementing project alternatives.

Phases of the study in accordance with a format established by the New Hampshire Department of Transportation include:

➤ Phase I – Establishing the Scope of the Project and Defining Existing Resources

➤ Phase II – Screening of Conceptual Alternatives resulting in a Brief Rationale Report

➤ Phase III – Preparation of Draft Environmental Impact Statement (DEIS)

➤ Phase IV – Public Hearing

➤ Phase V – Preparation of Final Environmental Impact Statement (FEIS)

The process has the following key decision points:

- Concurrence with Purpose and Need (ACOE)
- Practicable Alternatives Sign-Off (ACOE)
- Report of the Special Committee (State of NH)
- Least Environmentally Damaging Practicable Alternative Sign-Off (ACOE)
- Record of Decision (FHWA)
- State Wetland Permit (NHDES)
- Section 404 Permit (ACOE)

During the course of the study process, public participation will be a key element relative to evaluating resources, impacts, and alternatives. Public Officials Meetings and Public Informational Meetings will be held periodically in each of the five communities along the corridor. In addition, an Advisory Task Force (ATF) has been established. The ATF is made up of two people appointed by each of the five communities directly affected, and two people appointed by the Regional Planning Commissions (one from each Commission) through which regions this section of I-93 passes. The ATF is expected to meet every 6 to 8 weeks in the evenings, with meeting locations rotated through the five communities. The public is encouraged to attend.

This Scoping Report will provide the basis in part for the "Purpose and Need for the Proposed Action" and “Affected Environment” of the DEIS. The report represents a cooperative effort among the Federal Highway Administration (FHWA), the New Hampshire Department of Transportation (NHDOT) and the project consultants. The consulting team consists of:

Engineering:	Vanasse Hangen Brustlin, Inc. (VHB)
Environmental:	ENSR
Socio-economic:	Municipal Resources, Inc. (MRI)
Historic/archaeologic:	The Public Archaeology Laboratory, Inc. (PAL)

1.2 Project Setting and Overview

The I-93 Study Area is located in southern New Hampshire (**Figure 1-1**). The primary Study Area is within the five communities of Salem, Windham, Derry and Londonderry in Rockingham County, and Manchester in Hillsborough County.

The Study Area is generally located in the Seaboard Lowland section of New England, and is characterized by low rolling hills rising 100 to 300 feet above the intervening stream valleys. The present landscape character is largely the result of glaciation. Important natural features include a number of lakes and major stream systems; in particular, Canobie Lake, Cobbetts Pond, Spicket River and tributaries, Beaver Brook and tributaries, and Cohas Brook and tributaries. These resources are discussed in greater detail in later sections of this report.

The I-93 highway is fed by a network of state and local roadways. Major east-west roads include NH 101 and I-293, NH 102, NH 111, NH 111A, NH 97, and NH 38. Major north-south roads in proximity to I-93 include NH 28, NH 28 Bypass, and NH 128.

Also within the study parameters are two railroad corridors. Although these rail corridors lie outside the primary Study Area and do not currently provide passenger services, they will be a part of this I-93 study. These rail corridors have the potential for reducing demand on the I-93 corridor. Issues pertinent to the institution of passenger rail service along the two existing rail corridors include identification of infrastructure requirements,

operational issues, equipment requirements, station locations, and ridership potential. These issues will be evaluated as part of this study.

Both rail corridors were once part of the former Boston and Maine Railroad's system **(Figure 1-1)**. The East Rail Corridor extends from Manchester southerly through Londonderry, Derry, Windham, and Salem to Lawrence, Massachusetts. This rail corridor, located on the former B&M Manchester & Lawrence Branch, essentially parallels the I-93 highway corridor throughout its 28-mile length. The West Rail Corridor extends from Manchester through Bedford, Merrimack, and Nashua to Lowell, Massachusetts. This rail corridor, located on the former B&M New Hampshire Main Line, runs along the west side of the Merrimack River parallel to the FE Everett Turnpike throughout its 30-mile length **(Figure 1-1)**. In Bedford, the rail line crosses the Merrimack River to access downtown Manchester.

Discussion of these rail corridors is presented in **Section 2.3**.

The section of I-93 being studied is approximately 18 miles long extending from the Massachusetts border in Salem to the junction of I-93 with I-293 in Manchester ("Regional Location Map", **Figure 1-1**). I-93 is a limited (fully controlled) access highway originally constructed in the early 1960's. At present it consists of four lanes (two lanes northbound, two lanes southbound). The roadway right-of-way generally varies from about 150 to 500 feet in width. The median (distance between lanes of opposing direction) is typically 70 feet or more in width, although in some areas it is as narrow as 30 feet. Near Exit 3, the northbound and southbound lanes diverge so that the lanes are separated by over 1,200 feet.

For purposes of inventorying environmental resources which might be directly impacted as a result of improving the existing highway, the primary Study Area is generally defined as a band 500 feet east and west of the northbound and southbound lanes, and is a minimum of 1000 feet wide, with additional width where the I-93 northbound and southbound barrels diverge. Because of the existing infrastructure investment, relocation of the existing highway outside the existing 1000-foot corridor limit is not a consideration. The Study Area in the vicinity of each of the five interchange areas extends to each side of the existing I-93 right-of-way approximately 2,000 feet along the connecting roadways. The width along the connecting roadways is approximately 1,000 feet.

The north/south Study Area limits are based on political geographical boundaries (NH/MASS state line) and previously completed improvements at the interchange of I-93 and I-293/NH 101 constructed in the early 1990's. These boundaries mark the extent of potential direct impact to environmental resources. They do not however limit the evaluation of Traffic Demand Management (TDM) measures and mass transit alternatives, which may logically have to extend further to the north or south.

For the purpose of evaluating secondary and cumulative impacts, consideration must be given to those areas serviced by, and thus subject to the influence of, the I-93 highway corridor along the 18-mile segment under study. As a first step in the effort to gauge the sphere of influence of I-93, the regional context of the highway was examined utilizing data from an Origin & Destination profile done for the project. The total number of responses by town of origin were grouped according to order of magnitude (0 to 1 trip origins per town, 1 to 10 origins, 10 to 125, and 125 to 1,000 or more) and then plotted and graphically shaded on the map, with darker shading indicating higher numbers of trip origins. This method is overly general for considering the study limits for secondary and cumulative impacts; however, it does highlight that the towns immediately adjacent to I-93 exhibit the highest propensity to serve as origins for I-93 user trips, and thus are most susceptible to secondary and cumulative impacts. The results are illustrated graphically by the two denser shaded areas on **Figure 1-2**.

While the highway draws traffic from beyond the immediate communities through which it passes, the relative number of trip origins per unit area is more diffused the further the distance from the highway.

1.3 Existing Roadway System

I-93, a major link in the Interstate system as well as the National Highway System, extends from Boston, Massachusetts to just north of the New Hampshire/Vermont border near Littleton, New Hampshire in the north. It is a principal arterial interstate highway and it provides an important transportation corridor between the greater Boston metropolitan area and the New Hampshire communities in the south central part of the state. The highway is limited access (i.e., no access between the highway and abutting private property) with access along the study area segment available only from the five interchanges spaced along the corridor.

I-93, as originally constructed in the early 1960's, was expected to carry 20,000 vehicles per day within its design life of 20 years. In 1997, traffic volumes were recorded in Salem (south of Exit 1) in excess of 100,000 vehicles per day, with the segments to the north carrying between 60,000 and 80,000 vehicles per day. Operating conditions, during the peak hours of the day, are currently poor with the segments of the corridor south of Exit 4 operating at LOS E or F. Each of the interchanges also exhibit poor levels of service. Exit 4 was reconstructed in1990 in part to eliminate the poor weave condition at the SB ramps and the recurring hazard of northbound traffic trying to exit I-93 NB backing up onto I-93. Exit 3 is experiencing similar backups and congestion problems, and Exits 2 and 5 are also due for major renovations to provide safe and efficient access to the highway. There is urgent need to make improvements to relieve traffic congestion either by increasing the capacity of the highway or decreasing demand.

Figure
1-1 Regional Location Map

Figure
1-2 Origin & Destination Study Results

Since the construction of the I-93 segment under study, there have been a number of major projects along the I-93 corridor (involving bridges, rest areas, weigh stations) but only two projects involving safety and traffic operational improvements: the widening of the northbound barrel at Exit 1 required to provide safe access to the Rockingham Mall in Salem (1990), and the previously mentioned reconstruction of the Exit 4 interchange to provide safe and efficient movement between I-93 and NH 102 (1990).

At present, there are several highway projects affecting I-93 under study or design. A section of NH 111 in Windham and Salem is scheduled to be reconstructed beginning in 2004. The improvements are proposed in an effort to improve safety and relieve traffic congestion along NH 111 from the I-93/Exit 3 interchange in Windham easterly to the previously improved segment of NH 111 in Salem. The Towns of Derry and Londonderry are currently in the preliminary design/environmental evaluation process to consider alternatives and propose construction for a new interchange to be located between Exits 4 and 5, locally referred to as Exit 4A. The schedule calls for completing the Exit 4A study by the Spring of 2001 and beginning construction (assuming funding is available) in the Spring of 2003.

A third study, strongly supported by the NH State Legislature, involves constructing a corridor to provide access between the F. E. Everett Turnpike and the Manchester Airport. The preferred alternative for the proposed access road, as presented at a Public Hearing in April 1998, will allow for improved transportation service to the airport and to the surrounding industrial area from the F. E. Everett Turnpike. As currently proposed, these improvements do not include a connection to I-93.

The Salem rest area off the northbound barrel was reconstructed in 1993. In addition, several bridges carrying I-93 over local roadways and waterways have been (or will soon be) reconstructed or replaced. All of these bridges are (or prior to construction, were) deficient relative to structural condition. Construction has been ongoing since 1994. The condition of these bridges reflects, to a degree, the condition of the highway. After more than 30 years of service, the highway is showing signs of serious deterioration.

These bridges include:

- the northbound bridge over NH 111A in Windham (replaced in 1994),
- the northbound (replaced in 1994) and southbound (replaced in 1996) bridges over Bridge Street (North Lowell Road) in Windham,
- the northbound and southbound bridges over Fordway Extension in Derry (widened and rehabilitated in 1996),
- the northbound and southbound bridges over Kendall Pond Road in Derry (widened and rehabilitated in 1996),

- the northbound (replaced in 1995) and southbound (replaced in 1994) bridges over Stonehenge Road in Londonderry,

- the northbound bridge over Cohas Brook in Manchester (widening and rehabilitation scheduled for 2000), and

- the northbound and southbound bridges over Bodwell Road and the southbound bridge over the I-293 WB ramp in Manchester (widening and rehabilitation scheduled for 2000).

In addition, the northbound and southbound weigh stations in Windham are currently in the process of being replaced (currently under construction) while improvements to I-293 (from the Merrimack River to the east) and the I-293/NH 101/I-93 interchange area are scheduled for reconstruction in 2001.

It should also be noted that Massachusetts is also going forward with a study of the section of I-93 from the New Hampshire state line southerly through Methuen and Andover. The study will consider a range of alternatives and make recommendations for further studies and eventual construction in Massachusetts.

1.4 Purpose and Need for Action

The purpose of this project is to improve transportation efficiency, and reduce safety problems associated with this approximately 18-mile segment of I-93 between Salem and Manchester. Options including reactivating rail service, improving bus transit service and other TDM strategies that reduce vehicle trips on I-93 will be considered, in addition to widening the mainline and reconstructing the interchanges. However, it is envisioned that the TDM options, in and of themselves, will not be adequate in addressing the mobility needs and safety deficiencies within the corridor.

I-93 is a north-south principal arterial interstate highway within the State of New Hampshire and is part of the National System of Interstate and Defense Highways. I-93 in New Hampshire extends from the Massachusetts border at Salem, New Hampshire to the Vermont border at Littleton, New Hampshire. The segment of I-93 under study intersects many of the important highway routes in southern New Hampshire. Due to growth, development, and recreation opportunities in New Hampshire, the travel demands for I-93 between Salem and Manchester have exceeded the capacity of this existing four-lane facility. Population and traffic projections for the next twenty years support the conclusion that the existing facility will be increasingly less able to function at the levels of service and safety for which it was originally designed. Decreases in the level of service are evident in the reduced traveling speeds, increased density of traffic flow, as well as in the traffic backups at some interchanges during commuting hours.

Traffic backups and congestion routinely occur due to traffic incidents such as accidents and vehicle breakdowns. A decrease in the level of safety is documented in recent accident data. As one of the main arterials in the New Hampshire highway system, it is important that this roadway function properly to serve all users. The New Hampshire Legislature recognized the need for improving this highway and included the project in the State Ten-Year Highway Plan when that plan was enacted into legislation in 1986.

1.4.1 Traffic Flow and Congestion

During weekday peak hours, motorists traveling along the I-93 corridor currently experience traffic congestion and substantial delay. The congestion not only results in increased travel times, but also contributes to safety problems, as the limited spacing between vehicles does not afford the motorists desired mobility – often leading to frequent and abrupt lane change maneuvers.

Base year Average Daily Traffic (ADT) volumes for 1997 range from approximately 61,800 vehicles per day (vpd) between Exits 3 and 4 to as high as 104,400 vpd south of Exit 1. Operating conditions during the peak hours of the day are currently poor with the segments of the corridor south of Exit 4 operating at LOS E or F. Interchange operations at Exits 1, 2, and 3 also break down during weekday peak hours.

Traffic operations are expected to continue to deteriorate under future conditions, as traffic volumes increase. Traffic forecasts for the year 2020 show ADT's ranging from approximately 73,000 vpd between Exits 3 and 4 to as high as 137,000 vpd south of Exit 1. This level of traffic would result in substantial congestion along I-93, at the corridor interchanges, and along nearby local roadways. This additional delay experienced by motorists would be expected to expand to more hours of the day and to a greater number of days during the year. Accident frequency would be expected to increase as a result of the increased level of congestion.

The ADT's along the segments of I-93 for the 1997 Existing and 2020 Design Year conditions are summarized in Table 1-1.

Table 1-1
I-93 Average Daily Traffic (1997 & 2020)*

Segment	1997 ADT (VPD)**	2020 ADT*** (VPD)**
North of Exit 5	69,300	84,300
Between Exits 4 and 5	64,900	81,200
Between Exits 3 and 4	61,800	73,000
Between Exits 2 and 3	74,900	98,000
Between Exits 1 and 2	81,100	103,600
South of Exit 1	104,400	137,000

* ADT's are based on I-93 Subarea Traffic Model
**VPD = vehicles per day
*** 2020 ADT assumes that existing 4-lane facility is still in place.

Safety Issues/Accident Data

A review of accident data for the five-year period of January 1995 through December 1999 revealed a total of 1,227 accidents. Four Hundred and Eleven accidents (33 percent) resulted in personal injury with an additional 15 accidents (1 percent) resulting in a fatality. The remaining 801 accidents (65) percent resulted in property damage only.

The number of accidents that occurred between 1995 and 1997 revealed a steady decline with the number of accidents each year recorded at 253, 236 and 203 respectively. However, the trend was broken in 1998 when 292 accidents – the highest during the five-year period – was recorded. The number of accidents again declined slightly in 1999 with 243 accidents reported.

The segment of I-93 between Exits 3 and 4 recorded the highest number of accidents with 375 accidents (31 percent). Two hundred accidents (16 percent) were recorded between Exit 5 and I-293. The segments between Exits 4 and 5, and between Exits 2 and 3 recorded 162 accidents (13 percent) and 159 accidents (13 percent) respectively. The segments between Exit 1 and Exit 2, and between the MA state line and Exit 1 recorded the fewest accidents with 106 (9 percent) and 96 (8 percent) respectively. The number of accidents that occurred at each of the interchanges range from a low of 11 at I-293 to a high of 22 at Exit 4. It is important to note that the exact location of accidents is not, in all cases, available. Some of the accidents that have been identified as occurring along a segment of I-93 may have occurred at, or close to, an interchange.

Geometric deficiencies exist within the corridor and may be a contributing factor in some of the reported accidents. Each of the interchange areas has some ramps with less than desirable grades and some acceleration and deceleration lanes with less than desirable lengths. In addition, the mainline grades are also less than desirable at several locations

along the corridor. These deficiencies will need to be addressed as part of this study and may require interim measures to mitigate some of these issues, where feasible. As traffic continues to grow, the existing deficiencies will become more of a problem.